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INFLUENCE OF HEREDITY ON HUMAN SOCIETY

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Human society is a loose organization of the people of any race or country that is based on traditions and consensus of opinion expressed both in "good manners" and written laws. Such an organization tends to make more agreeable and effective man's existence as a gregarious species. Human society is not everywhere the same, because the traditions of peoples differ. The best citizens in certain regions of Africa go clad in a way that would lead to incarceration in Philadelphia, while the marital relations of certain oriental countries would have been considered impossible in the loosest era of the Dakotas. Recognizing once for all the arbitrary nature of our social traditions, we have to consider how heredity influences the white man's society of the United States of to-day.

First of all it is necessary to point out that, until recently at least, human society was founded on a fundamentally wrong assumption that all men are created alike free agents, capable of willing good or evil, and of accepting or rejecting the invitation to join the society of normal men. But in recent decades legislators have come to realize that human protoplasm is vastly more complex than their philosophy conceived, and that the normal man is an ideal and hardly a real thing. Every man is a bundle of characteristics, and no two are exactly alike. Not only has he the physical characteristics of brown, black or red hair, blue or brown eyes, short or tall stature, slight or heavy weight, but he has a mass of less evident but, in their relation to human society, more important qualities. His sense organs may be nearly normal or very defective, so that he cannot see the color of the signals displayed to the train he is controlling or hear the submarine sound that tells of impending collision, or smell the smoke that should warn him to alarm the sleeping inmates. The position and connections of the association fibres of the brain may approach the

typical condition or they may be so aberrant that the person misinterprets the things he sees. His brain may be incapable of developing properly in single or all directions, so that he remains with defective judgment, memory and, even, instincts, unable to appreciate the traditions of human society or, perhaps, impelled constantly to run counter to the fundamental principles of that society—tearing them into shreds. He may be subject to illusions or hallucinations; he may suffer from melancholia or paranoia in its multifarious forms, leading him to commit arson or murder and to assassinate high officials. Heavy is the toll human society pays for the presence of these degenerates.

If these qualities of degeneration were merely sporadic, accidental, due to a rare combination of environmental conditions, human society could protect itself sufficiently by secluding the feeble-minded, imprisoning those with active forms of psychoses and putting to death those with homicidal tendency. But, on the contrary, just these defective conditions are inevitably transmitted in the germ plasm and are apparently being reproduced faster than the more normal characteristics. Thus Dr. G. A. Doren, of the Ohio Institution for Feeble-Minded Youth, states:¹ “Unless preventive measures against the continuously progressive increase of the defective classes are adopted, such a calamity as the gradual eclipse, slow decay and final disintegration of our present form of society and government is *not only possible, but probable*.” At a time when, through prudential restraint, the birth rate of the best blood of our nation barely suffices to replace that lost by death, the unrestrained, erotic characteristics of the degenerate classes are resulting in large families, which are withdrawn from the beneficent operation of natural selection by a misguided society that is nursing in her bosom the asp that may one day fatally poison her. Modern studies in heredity show us the danger. Whenever a unit quality or characteristic is lacking in *both* parents it will be wanting in all of their offspring. If both lack the capacity of developing properly the cortical cells all of the children will be wanting in this respect. Some of the cases described by Dr. Martin W. Barr² are certainly or probably of this sort. He states that he has known “Three imbecile children [who] have parents each of whom is both imbecile and drunken”; “an imbecile deaf mute, an inmate of an alms-

¹“Our Defective Classes. How to care for them and prevent their increase.” Columbus, Ohio, 1902.

²Alienist and Neurologist. August, 1905.

house from girlhood, is the mother of six illegitimate idiot children. I have recently been called to examine . . . an imbecile woman with seven illegitimate idiot children. I know, furthermore, of a family of twelve brothers and sisters all of the lowest grade of idiocy, two lapping their food like dogs, their only language animal cries." The history of the Jukes suggests the same method of inheritance for laziness. The pauper harlot, Ada Juke, married a lazy husband. Both parents are temperate, but all four children are indolent, even the most industrious having received outdoor relief. One of these children marries a lazy man, and all of the six children of whom as adults there is knowledge were lazy. One of these married a lazy woman, by whom he had nine children. Nothing further is known of three of them, but *all* of the others were recipients of outdoor relief. It will be observed that we have not here to do merely with a high percentage of pauperism in the offspring of two lazy people, but with 100 per cent., or complete, pauperism. The children cannot rise in any particular quality above the potentiality of their more advanced parent. Training the feeble-minded will develop the characteristics that are present, but will create no new ones. No amount of training will develop that of which there is no germ; you may water the ground and till it and the sun may shine on it, but where there is no seed there will be no harvest.

Modern studies in heredity, again, show that when one parent has a characteristic, and comes of a strain that has it purely developed, while the other lacks the characteristic, the children will all tend to have the characteristic, but in a diluted condition. Such a diluted characteristic is called *heterozygous*. In the germ cells of such children the character segregates into half of the germ cells and the other half lack it. Where two such individuals possessing a *heterozygous* character marry each other, then, on the average, one-fourth of the offspring will result from the union of two germ cells possessing the character, two-fourths from one germ cell possessing and one lacking the character, and one-fourth from two germ cells lacking the character—children from two such germ cells will, of course, be without the character even though both of their parents possess it. We have, possibly, a case of that sort in the Jukes. In the legitimate branch of Ada, the harlot, which intermarried with that of Clara, the chaste, there are in generation No. 5 four sisters, children of an industrious father and a chaste,

legitimate mother, whose mother, in turn, was a chaste daughter of Clara. Returning to the father, we find his mother a chaste daughter of Clara. From two such chaste parents, then, are born the aforesaid four daughters—three chaste and one a harlot. How is this? Simply the chastity of the parents was heterozygous. Their father's father was the licentious son of Ada, the harlot, and their mother's father was the son of Belle, the prostitute. The proportions 3 to 1, familiar to every student of mendelian heredity, is thus exactly realized in these children of two parents heterozygous in respect to chastity. Environment seems to have had as little to do with the result as with the color of the lambs in my flock of sheep. Indeed, we know already that *many* human characteristics are inherited in mendelian fashion—polydactylism, syndactylism, short fingeredness, bleeding or haemophilia, night blindness, congenital cataract, color blindness, keratosis palmæ, albinism, eye color, color and curliness of the hair. Doubtless many, if not all, of the elementary, physical, intellectual and moral characters are thus inherited. The clear lesson of mendelian studies to human society is this: That when two parents with the same defect marry—and there is none of us without some defect—*all* of the progeny must have the same defect, and there is no remedy for the defect by education, but only, at the most in a few cases, by a surgical operation.

Hitherto I have spoken chiefly of heredity of defects, and I have done so because here heredity appears in its simplest form. When any quality is absent in both parents it is absent in *all* children, while a quality that is present in the parents may be heterozygous—in which case it may become absent in some of the children—or it may be homozygous, in which case it will be passed on to 100 per cent. of the progeny. Moreover, the presence of a character in one parent will dominate over its absence in the other parent, and that is why the offspring of a parent *with* a pure character mated to a parent *without* will *all* possess the character. The advanced condition masters the retarded or absent condition. It is obvious that the inheritance of positive characters is relatively complex.

The importance to human society of positive characteristics in the germ plasm needs little argument. All will admit the debt of society to the Bach family, containing musicians for eight generations, of which twenty-nine eminent ones were assembled at one family

gathering; to the family of the painter Titian (Vecellio) with nine painters of merit; to the Bernouilli family, of Swiss origin, with ten members famous as mathematicians, physicists and naturalists; to the Jussieu family, of France, with five eminent botanists; to the Darwin family, which gave not only Charles Darwin, his eminent grandfather, Erasmus, and his cousin, Francis Galton, but also among the children of Charles, a mathematical astronomer of the first rank, a professor of plant physiology at Cambridge University, an inventor of scientific instruments of precision, and a member of Parliament; in this country to an Adams family of statesmen, an Abbott family of authors, a Beecher family of authors and preachers, and an Edwards family that has supplied this country with many of its great college presidents and educators, men of science, leaders in philanthropic movements, inventors, and leaders in the industrial world.

Important as are these great families, their qualities represent only a small fraction of the powerful hereditary characteristics that are inherent in our best protoplasm. In this day of *conservation* would that we might keep in mind that this protoplasm is our most valuable national resource, and that our greatest duty to the future is to maintain it and transmit it improved to subsequent generations, to the end that our human society may be maintained and improved.

We have considered the influence on human society of protoplasm *deficient* in the characters that determine sensitiveness, energy, proper association of ideas, inhibitions and other qualities that go to make a normal, moral, effective man. We have seen, on the other hand, what a precious heritage is in the extraordinarily favorable combinations of favorable characters found in certain grand families. Between these extremes lies the great mass of human beings that are not enrolled on the record books of asylums or houses of detention nor listed in "Who's Who," but which constitute the mainstay of human society. What that society shall be in the future depends on the characteristics of the common people of the future. The question of questions in eugenics is this: How shall the inroads of degeneracy be prevented and the best of our human qualities preserved and disseminated among all the people?

First, the scandal of illegitimate reproduction among imbeciles must be prevented. That class often shows a frightful fecundity. If segregation is inadequate protection and since reason cannot

overcome the sentiment against destruction of the lowest-grade imbeciles, at least operations should be required that will prevent the reproduction of their vicious germ plasm.

Second, the old idea that there is in society any *class* that is superior to any other class should be abandoned. It is the *characteristics* of the germ plasm and not individuals as a whole that are favorable or prejudicial to human society. The way to improve the race is first to get facts as to the inheritance of different characteristics and then by acquainting people with the facts lead them to make for themselves suitable matings. The only rule, a very general one, that can be given at present is that a person should select as consort one who is strong in those desirable characters in which he is himself weak, but may be weak where he is strong. Such a marriage will not necessarily lead to a reduction in the children of the strong characters, certainly not to a permanent reduction in subsequent generations, and it will probably lead to a functional disappearance of the weak condition. By appropriate selection of consorts in subsequent generations the weak condition may not reappear for a long time, if at all. Thus two parents, deaf from *different* causes, will have only hearing children, because each parent contributes the factor that the other lacked, and if the children marry into stock with normal audition the ancestral defect will probably not reappear. But if *cousins* with the *same hidden* defects marry, there is one chance in four of two germ cells with the *same* defect meeting and reproducing the defect. Herein lies the danger of consanguinous marriages. For there is hardly a person born with every desirable characteristic present in the germ plasm and *relatives* are apt to have the same defects and so are especially apt to have defective children. Outcrossings, marriages between unrelated persons, diminish the chances for a similar combination from both sides. The mating of dissimilars favors a combination in the offspring of the strongest characteristics of both parents and fits them the better for human society.

In what I have said I have repeatedly approached, and very likely at times passed beyond, the borderland of science. I would not be satisfied to leave you with the false idea that our knowledge of heredity is now complete. Rather would I urge that perhaps the greatest need of the day for the progress of social science is additional precise data as to the unit characteristics of man and their methods of inheritance.